MARKED-UP AMENDED CLAIMS

61. (Five Times Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, a distal shaft section with a proximal portion and a distal portion and a wall portion defining at least in part an inner lumen extending within the distal shaft section;

b) an elongated core member disposed within the inner lumen;

c) a plurality of coil electrodes on the proximal portion of the distal shaft section, having an inter-electrode spacing of about 1 mm to not greater than 3 mm;

d) a plurality of electrical conductors which are at least partially embedded within a wall of the elongated shaft, and which have distal ends electrically connected to one of the coil electrodes on the proximal shaft portion; and

e) at least one temperature sensor on an exterior portion of the distal shaft section which is disposed between two adjacent coil electrodes and which has a conductive metallic band disposed over and connected to the sensor, said band surrounding the distal shaft section, being [that is] configured to engage tissue adjacent to the conductive metallic band, to equilibrate engaged tissue temperature about the conductive metallic band and to ~~facilitate detecting~~ detect engaged tissue temperature adjacent to the conductive metallic band.

62. (Five Times Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, a distal shaft section with a proximal portion and a distal portion and a wall portion defining at least in part an inner lumen extending within the distal shaft section;

b) a plurality of coiled electrodes on the proximal portion of the distal shaft section, having an inter-electrode spacing of about 1 mm to not greater than 3 mm;

c) at least one temperature sensor on an exterior portion of the distal shaft section disposed between two adjacent electrodes and having a conductive metallic band disposed over and connected to the sensor, [which is] said conductive metallic band surrounding the distal shaft section and being configured to engage tissue adjacent to the conductive metallic band, to equilibrate engaged tissue temperature about the conductive metallic band and to thereby facilitate detection of tissue temperature adjacent to the conductive metallic band; [and]

d) a first electrical conductor which is at least partially embedded within a wall of the elongated shaft, and which has a distal end electrically connected to the at least one temperature sensor on the proximal shaft portion; and

e) a second electrical conductor which is at least partially embedded within a wall of the elongated shaft and which has a distal end electrically connected to the at least one temperature sensor on the proximal shaft portion.

63. (Six Times Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, a distal shaft section with a proximal portion and a distal portion and a wall portion defining at least in part an inner lumen extending within the distal shaft section;

b) a plurality of partially covered coil electrodes on the proximal portion of the distal shaft section;

c) at least one temperature sensor on an exterior portion of the distal shaft section disposed between two adjacent coil electrodes and having a conductive metal band disposed over and connected to the at least one temperature sensor, the conductive metal band surrounding the distal shaft section and being configured to engage tissue adjacent to the conductive metal band, to equilibrate engaged tissue temperature about the conductive metal band and to thereby facilitate detection of tissue temperature adjacent to the conductive metal band;

d) a first electrical conductor which has a distal end electrically connected to the at least one temperature sensor on the proximal shaft portion and which is embedded within said wall portion;

e) a second electrical conductor which is embedded within said wall portion and which has a distal end electrically connected to the at least one temperature sensor; and

f) a core member disposed in the inner lumen in the distal shaft section.

68. (Five Times Amended) A method for treating a patient, comprising:

a) the step of providing an electrophysiology device, comprising:

an elongated shaft having a proximal end, a distal end, and a distal shaft section, and a plurality of electrical conductors embedded within a wall of the distal shaft section;

a plurality of coil electrodes on an exterior portion of the distal shaft section electrically connected to the electrical conductors, having an inter-electrode spacing of not more than about 3 mm;

a plurality of temperature sensors on an exterior portion of the distal shaft section, being positioned so that at least one temperature sensor is disposed between two adjacent electrodes, each temperature sensor being electrically connected to two electrical conductors embedded within said wall and having a conductive metallic band disposed over and connected to the sensor, the conductive metallic band surrounding the distal shaft section, being configured to engage tissue adjacent to the conductive metallic band, to equilibrate engaged tissue temperature about the conductive metallic band and to thereby facilitate detection of tissue temperature adjacent to the conductive metallic band;

b) the step of introducing the device into the patient's vasculature and advancing the device until the distal section of the device is disposed at a desired location;

c) the step of positioning the device within a location of the patient's vasculature where one or more coil electrodes are in contact with a desired surface within the vasculature;

d) the step of delivering high frequency electrical energy to the one or more coil electrodes in contact with the desired surface to ablate tissue; [and]

e) the step of detecting electrical activity with one or more of the coil electrodes after tissue ablation to determine the effectiveness of the tissue ablation; and

f). the step of engaging adjacent tissue with the conductive metallic band, equilibrating engaged tissue temperature about the conductive metallic band and detecting engaged tissue temperature with the temperature sensor in contact with the conductive metallic band.

69. (Three Times Amended) The method of claim 68 wherein high frequency electrical energy is directed to the coil electrodes sequentially in a proximal direction.

70. (Five Times Amended) An electrophysiology device for forming a continuous lesion in a patient's heart tissue, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section;

b) a plurality of partially covered coil electrodes on a proximal portion of the distal shaft section, with each electrode having a length of about 2 to about 8 mm and inter-electrode spacing of about 1 mm to not greater than 3 mm;

c) at least one temperature sensor disposed between two adjacent coil electrodes and having a conductive metallic band disposed over and connected to the sensor, the conductive metallic band being configured to engage tissue adjacent to the band, to equilibrate tissue temperature about the conductive metallic band and to thereby facilitate detection of tissue temperature adjacent to the band; and

d) two electrical conductors embedded within a wall of the distal shaft section and electrically connected to the at least one temperature sensor.

71. (Five Times Amended) A method of treating a patient for cardiac arrhythmia by electrically isolating a first tissue region from a second tissue region, comprising:

a) providing an electrophysiology device having an elongated shaft which has a proximal end, a distal shaft section having a proximal portion with a plurality of coil electrodes with temperature sensors between adjacent coil electrodes having conductive metal bands disposed over and connected to the sensors and at two electrical conductors which are connected to the temperature sensors and which are embedded within a wall of the distal shaft section, the conductive metal bands being configured to engage tissue adjacent to the conductive metal bands [band], to equilibrate engaged tissue temperature about the conductive metal bands and to thereby facilitate detection of tissue temperature adjacent to the conductive metal bands and the distal shaft section having a distal portion with a distal end:

b) positioning the proximal portion of the distal shaft section at a desired location between the first tissue region and the second tissue region;

c) ablating a continuous lesion pattern between the first and second tissue regions with the electrodes on the proximal portion of the distal shaft section to electrically isolate the two tissue regions; and

d) monitoring tissue temperature adjacent to the conductive metallic bands with the temperature sensors in contact with the conductive metallic bands.

72. (Pending) The method of claim 71 wherein an electrode is provided on the distal end of the distal portion of the distal shaft section.

73. (Five Times Amended) An electrophysiology device for treating cardiac arrhythmia by electrically isolating a first tissue region from a second tissue region, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section with a proximal portion and a distal portion with a wall defining an inner lumen extending therein;

b) a plurality of coil electrodes on the proximal portion of the distal shaft section, having an inter-electrode spacing not greater than 3 mm;

c) at least one temperature sensor on the distal shaft section disposed between two adjacent coil electrodes and having a conductive metallic band extending over and connected to the sensor, the conductive metallic band being configured to engage tissue adjacent to the conductive metallic band, to equilibrate engaged tissue temperature about the

conductive metallic band and to facilitate detection of tissue temperature adjacent to the conductive metallic band, two electrical [conductor] conductors embedded within said wall and electrically connected to the at least one temperature sensor; and

d) a core member extending at least within the distal shaft section formed of a material selected from the group consisting of stainless steel and a NiTi alloy.

74. (Pending) The electrophysiology device of claim 73 wherein the NiTi alloy exhibits superelasticity.

75. (Pending) The electrophysiology device of claim 73 wherein the NiTi alloy has a stable austenite phase at body temperature.

76. (Pending) The electrophysiology device of claim 73 wherein the NiTi alloy exhibits stress induced austenite-to-martensite phase transformation.

77. (Five Times Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section with a proximal portion, a distal portion and a wall defining an inner lumen extending within the distal shaft section;

b) a plurality of coil electrode means for ablation on the proximal portion of the distal shaft section, having a spacing between electrode means of about 1 mm to not greater than 3 mm;

c) at least one temperature sensor on an exterior portion of the distal shaft section disposed between two adjacent electrode means and having a conductive metallic band disposed over and connected to the sensor, the

conductive metallic band being configured to engage tissue adjacent to the conductive metallic band, to equilibrate engaged tissue temperature about the conductive metallic band and to facilitate detection of tissue temperature adjacent to the conductive metallic band;

d) two electrical conductors embedded within the wall and electrically connected to the at least one temperature sensor; and

e. an elongated core member disposed within the inner lumen in the distal shaft section.

78. (Amended) An electrophysiology device for electrically isolating a first tissue region from a second tissue region of a patient's heart, comprising:

a) an elongated shaft having a proximal end, a distal end, a distal shaft section having a plurality of ablation coil electrodes configured to isolate the first tissue region from the second tissue region and a wall portion defining an inner lumen extending within at least the distal shaft section;

b. the distal shaft section having at least one temperature sensor with a thermally conducting member secured to the temperature sensor that is configured to surround the distal shaft section so as to equilibrate surrounding temperature about the thermally conducting member and that is attached to the electrode; and

c) two electrical conductors embedded within said wall portion and electrically connected to the at least one temperature sensor.

79. (Cancelled)

80. (New) A method of treating cardiac arrhythmia in a patient's heart by electrically isolating a first tissue region from a second tissue region of the patient's heart, comprising:

a. providing an electrophysiology device comprising

i) an elongated shaft having a proximal end, a distal end, and a distal shaft section and a wall portion defining an inner lumen extending within the distal shaft section;

ii) a plurality of coil electrodes on the distal shaft section, having an inter-electrode spacing not greater than 3 mm;

iii) a plurality of temperature sensors on the distal shaft section, each having a conductive metallic band secured thereto, said conductive metallic bands configured to surround the distal shaft section above one of the temperature sensors and be secured thereto to thereby facilitate detection of surrounding temperature;

iv) two electrical conductors electrically connected to each of the plurality of temperature sensors, said two conductors being embedded within the wall portion of the distal shaft section;

b) positioning the distal shaft section at a desired location between the first tissue region and the second tissue region with the plurality of coil electrodes engaging tissue to be ablated between the first and second tissue regions;

c) ablating a continuous lesion pattern between the first and second tissue regions by applying high frequency electrical energy to the plurality of coil

electrodes, said continuous lesion pattern electrically isolating the first and second tissue regions of the patient's heart;

d) detecting temperatures adjacent to the conductive metallic bands with the temperature sensors; and

e. controlling the ablation process based at least in part on the detected temperature.

81. (New) The method of claim 80 wherein at least one of the temperature sensors is secured to an adjacent electrode.